CONTAMINATION ASSESSMENT PLAN FOR FLYING CLUB BUILDING A127 NAS KEY WEST FL

7/1/1993

ABB ENVIRONMENTAL SERVICES INC

CONTAMINATION ASSESSMENT PLAN

FLYING CLUB, BUILDING A127
NAVAL AIR STATION KEY WEST
BOCA CHICA FIELD, KEY WEST, FLORIDA

Contract Task Order (CTO) 098

Contract Number N62467-89-D-0317

Prepared by:

ABB Environmental Services, Inc.
2590 Executive Center Circle East
Tallahassee, Florida 32301

Prepared for:

Department of the Navy, Southern Division
Naval Facilities Engineering Command
2155 Eagle Drive
North Charleston, South Carolina 29418

Luis Vazquez, Engineer-In-Charge

July 1993

FOREWORD

Subtitle I of the Hazardous and Solid Waste Amendments (HSWA) of 1984 to the Solid Waste Disposal Act (SWDA) of 1965 established a national regulatory program for managing underground storage tanks (USTs) containing hazardous materials, especially petroleum products. Hazardous wastes stored in USTs were already regulated under the Resource Conservation and Recovery Act (RCRA) of 1976, which was also an amendment to SWDA. Subtitle I requires that the U.S. Environmental Protection Agency (USEPA) promulgate UST regulations. The program was designed to be administered by the individual States, who were allowed to develop more stringent standards, but not less stringent standards. Local governments were permitted to establish regulatory programs and standards that are more stringent, but not less stringent than either State or Federal regulations. The USEPA UST regulations are found in the Code of Federal Regulations, Title 40, Part 280 (40 CFR 280) (*Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks*) and Title 40 CFR 281 (*Approval of State Underground Storage Tank Programs*). Title 40 CFR 280 was revised and published on September 23, 1988, and became effective December 22, 1988.

The Navy's UST program policy is to comply with all Federal, State, and local regulations pertaining to USTs. This report was prepared to satisfy the requirements of the Florida Department of Environmental Regulation (FDER, now designated Florida Department of Environmental Protection [FDEP]) Chapter 17-770, Florida Administrative Code (FAC) (*State Underground Petroleum Environmental Response*) regulations on petroleum contamination in Florida's environment as a result of spills or leaking tanks or piping.

TABLE OF CONTENTS

Contamination Assessment Plan
Flying Club, Building A127
Boca Chica Field, Key West, Florida

LIST OF FIGURES

GLOSSARY

ABB-ES	ABB Environmental Services, Inc.
ASTs	aboveground storage tanks
AVGAS	Aviation Gasoline
bls	below land surface
BTEX	benzene, toluene, ethylbenzene, and xylenes
CA	Contamination Assessment
CAP	Contamination Assessment Plan
CAR	Contamination Assessment Report
CFR	Code of Federal Regulations
CNO	Chief of Naval Operations
CTO	Contract Task Order
CompQAP	Comprehensive Quality Assurance Plan
FAC	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
FDER	Florida Department of Environmental Regulation
GC	gas chromatograph
HASP	Health and Safety Plan
HSWA	Hazardous and Solid Waste Amendments of 1984
ID	inside diameter
MOP	Monitoring Only Plan
NAS	Naval Air Station
NFAP	No Further Action Plan
OVA	organic vapor analyzer
PCBs	polychlorinated biphenyls
ppm	parts per million
PVC	polyvinyl chloride
QA/QC	quality assurance/quality control
RAP	Remedial Action Plan
RCRA	Resource Conservation and Recovery Act
SOUTHNAVFACENGCOM	Southern Division, Naval Facilities Engineering Command
SWDA	Solid Waste Disposal Act of 1965
TDS	total dissolved solids
USEPA	U.S. Environmental Protection Agency
USGS	U.S. Geological Survey
USTs	underground storage tanks

1.0 INTRODUCTION

ABB Environmental Services, Inc. (ABB-ES), has been contracted by Southern Division, Naval Facilities Engineering Command (SOUTHNAVFACENGCOM) to prepare a Contamination Assessment Plan (CAP) for the Flying Club, Building A127, at Boca Chica Field, Naval Air Station (NAS) Key West, Florida. The CAP outlines a field investigation and sampling program that will assess the source(s) of petroleum contamination in the vicinity of Building A127 and evaluate the horizontal and vertical the extent of any petroleum contamination detected. The following report presents the site location and develops the rationale for the proposed field investigation to be implemented under the Contamination Assessment (CA).

2.0 BACKGROUND

2.1 SITE DESCRIPTION. Naval Air Station Key West (NAS Key West), Monroe County, Florida, is located approximately 150 miles southwest of Miami. Key West is strategically significant because it is 90 miles north of Cuba and is the closest point in the United States to the West Indies and Central and South America.

NAS Key West, a complex of activities located in numerous areas of the lower Florida Keys, encompasses approximately 5,000 acres. The majority of these activities are concentrated on Boca Chica Key and Key West. NAS Key West, the host activity, is situated on Boca Chica Key and encompasses 3,250 acres.

NAS Key West's mission is to maintain and operate facilities and provide services and materials to support operations of aviation activities and units designated by the Chief of Naval Operations (CNO).

The Flying Club, Building A127, is located approximately 500 feet north of the north-northeast runway on Boca Chica Key (see Figure 9-1 in the attached Health and Safety Plan [HASP]). The site is currently used for Flying Club aircraft parking. The site consists of a broken asphalt lot, bounded by concrete to the south and west, and by Building A133 to the north.

2.2 SITE HISTORY. The Boca Chica Flying Club is an aircraft parking area and was formerly used as a refueling area. It is located south of Building A133 (Figure 2-1). The site is the former location of four aboveground storage tanks (ASTs) reported to have contained aviation gasoline (AVGAS). The ASTs, A127-A through A127-C, had a 560-gallon capacity. A127-D had a capacity of 1,000 gallons. All tanks and associated piping were removed in February 1992. The tanks were reportedly located approximately 70 feet south of Building A-133. Overfilling of these tanks is the suspected cause of contamination at the site.

The area, including Building A133, to the northeast of the former AST locations was reportedly used as a gasoline station in the past; however, a review of historic aerial photographs and interviews with onsite personnel during the ABB-ES site visit indicate that more likely uses may have included an auto hobby shop, motor pool, and staging area. Building A133 is currently used to store transformers, some of which contain polychlorinated biphenyls (PCBs). Transformers observed during the site visit were labeled as containing less than 50 parts per million (ppm) of PCBs.

2.3 GEOLOGY. The NAS Key West activities are located on the lower Florida Keys. The lower Keys are overlain by a mantle of oolitic limestone of the Miami Limestone. The oolitic limestone is thickest in the northern part of Stock Island, thinning to the south and southwest. Beneath the Miami Limestone lies the Key Largo coral reef limestone. Hoffmeister (1974) reported the Miami Limestone to be 27 feet thick and the Key Largo Limestone greater than 270 feet thick in the western part of Key West. The natural grade in much of the area in and around Boca Chica Key and Key West has either been altered or is completely

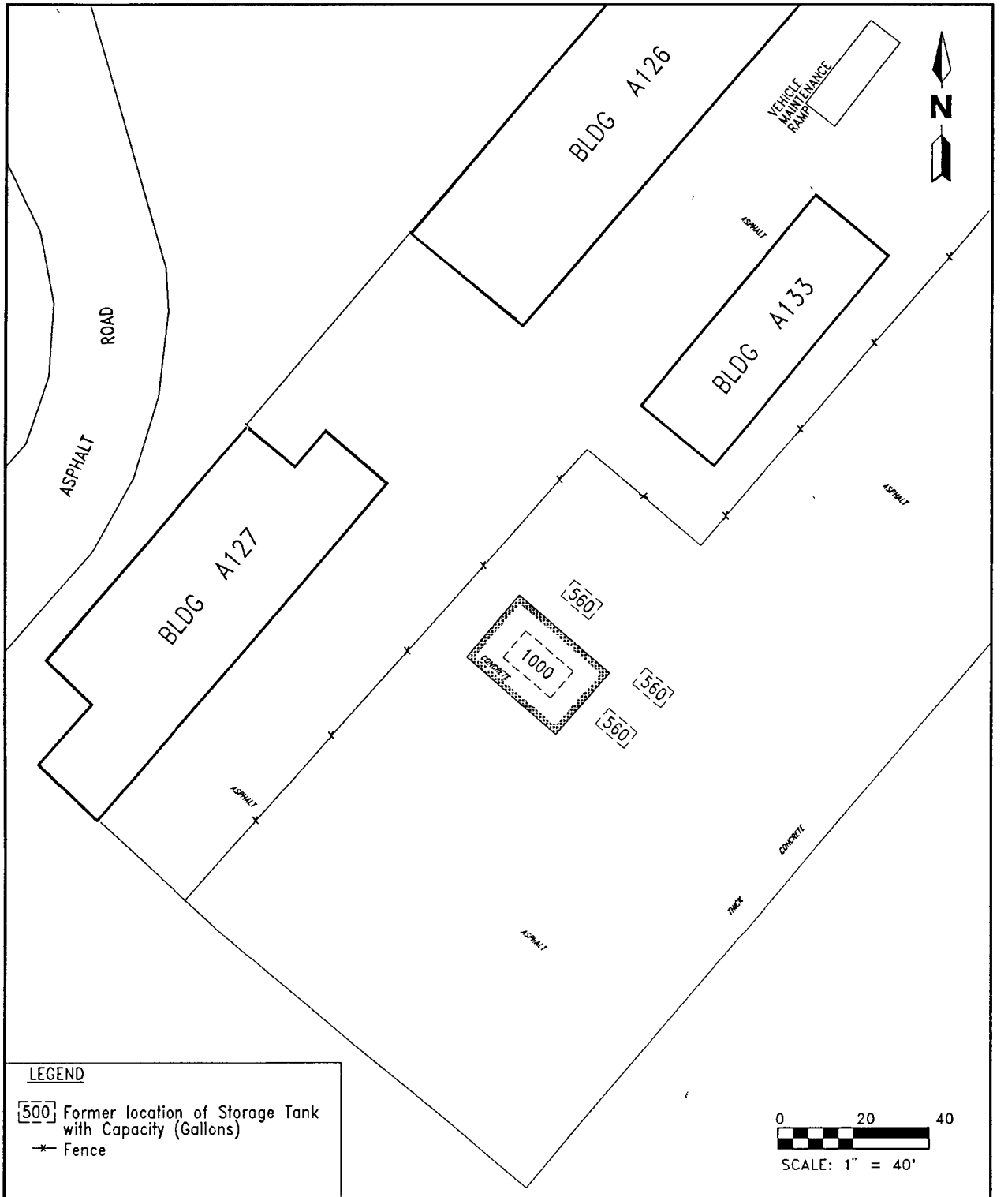


FIGURE 2-1
SITE PLAN

CONTAMINATION ASSESSMENT PLAN
FLYING CLUB
BOCA CHICA FIELD
NAS KEY WEST
KEY WEST, FLORIDA

FLYCLUB/KGP/07/21/93

manmade consisting of imported fill. Therefore, it is not uncommon to encounter fill materials at the surface or near surface.

2.4 HYDROGEOLOGY.

2.4.1 Regional The highly transmissive limestones of the lower Florida Keys generally contain brackish or saline water. Small areas of fresh groundwater exist on some of the larger islands (Black, Crow, and Eidness, 1977). The water-table aquifer is contained within both the Miami and Key Largo Limestones. Freshwater lenses that do exist are Class G-III groundwater with total dissolved solids (TDS) of >10,000 ppm and are subject to saltwater intrusion through the porous Key Largo Limestone and upward to the less porous Miami Limestone (Black, Crow, Eidness, 1977; McKenzie, 1990).

Groundwater in the Key West area discharges directly to the marine surface waters surrounding the islands. Many of these marine waters have been designated as Outstanding Florida Waters, a classification that affords them the highest environmental protection standards. TDS concentrations, calculated from specific conductance measurements of groundwater near the site, were in excess of 35,000 ppm (ABB-ES, 1991a; 1991b).

Due to the low land surface elevations in the lower Florida Keys, the water table is shallow. Recharge to the water-table aquifer is directly from precipitation and infiltration is rapid. Discharge, via groundwater flow, is to the surrounding surface waters. Water-table elevations can be greatly influenced by local rainfall and tides. The volume of fresh groundwater in the Key West area is limited; therefore, freshwater wells of any consequence do not exist. Potable water supplies are obtained by rainwater catchment, reverse osmosis desalination, or is imported from the mainland by way of the Florida Keys aqueduct.

2.4.2 Site Specific The water-table aquifer is the only aquifer of concern in the Key West area. This aquifer is unconfined in the Key West area. The water table may be encountered at less than 5 feet below land surface (bls). Groundwater flow is believed to be to the north, toward the bay. Fill material and rock from the surface to depths of 12 feet consist of white, slightly to heavily weathered, silty, hard limestone with some sand and shell fragments (ABB-ES, 1991a).

3.0 INVENTORY OF PROXIMATE POTABLE WATER WELLS

There are no known potable water wells in the Key West area. Potable water is imported from mainland Florida through the Florida Keys Aqueduct, captured by rainwater catchment, or obtained by reverse osmosis desalination. Small lenses of fresh groundwater exist in the area, but these lenses are subject to saltwater intrusion (Black, Crow, and Eidness, 1977).

4.0 PROPOSED ASSESSMENT PLAN

4.1 FIELD INVESTIGATION. Prior to the beginning of the field investigation, a start-up meeting will be held onsite at NAS Key West. All personnel associated with the investigation will review the scope of work in the CAP and HASP. Scheduling, logistics, and special precautions will be discussed.

The purpose of the CA field investigation is to assess the vertical and horizontal extent of soil and groundwater contamination and identify the types of contaminants at the site. The CA will require the drilling of soil borings and installation of monitoring wells at the site.

Approximately 30 soil borings will be advanced using a truck-mounted drill rig until the water table is encountered (see Figure 4-1). Soil samples will be collected using a split-spoon sampling device. Samples collected above the water table will be retrieved at 2-foot vertical intervals for organic vapor analyzer (OVA) screening in accordance with Florida Department of Environmental Protection (FDEP), formerly Florida Department of Environmental Regulation (FDER), Chapter 17-770.200 (2), Florida Administrative Code (FAC), guidelines. For soil borings in which monitoring wells will be installed, soil samples will continue to be collected below the water table every 5 feet until total depth is reached. Samples collected below the water table will be analyzed with a portable gas chromatograph (GC) for comparison with petroleum standards. The screening of soil samples from these borings will assist in evaluating the horizontal and vertical extent of the soil and groundwater contamination and provide information for the placement of groundwater monitoring wells. The proposed soil boring locations are shown in Figure 4-1. Actual locations of soil borings will be determined by the field team as more information is obtained about the contaminant plume during soil and groundwater screening.

Approximately 10 shallow (15 feet bls) permanent monitoring wells will be installed in selected soil borings to characterize the groundwater contaminant plume and assess its horizontal extent. Monitoring well locations will be based on the results of groundwater samples screened with a field GC used to quantitatively measure levels of benzene, toluene, ethyl benzene, and xylenes (BTEX). The shallow monitoring wells will be constructed of 2-inch inside diameter (ID), schedule 40, flush-threaded, polyvinyl chloride (PVC) screen and casing. At least 2 feet of screen will be placed above the water table to accommodate seasonal and tidal fluctuations of the water table. The screen will be surrounded with a 6/20 quartz sand filter pack to at least 1 foot above the top of the screen. A 1-foot bentonite seal will be placed above the filter pack. The remaining annulus will be grouted to land surface with neat cement.

Two deep monitoring wells (approximately 35 feet bls) will be installed at the site to assess the vertical extent of the groundwater contaminant plume. The deep monitoring wells will be constructed of 2-inch ID, schedule 40, flush-threaded, PVC screen and casing. Screen length will be 5 feet with a slotted screen opening of 0.010 inch. The boring wells will be placed within a 6-inch PVC surface casing, installed to prevent vertical dispersion of contaminants. Approximately 15 feet of each deep monitoring well will extend below the total depth of the surface casing. The screen will be surrounded with a 6/20 quartz

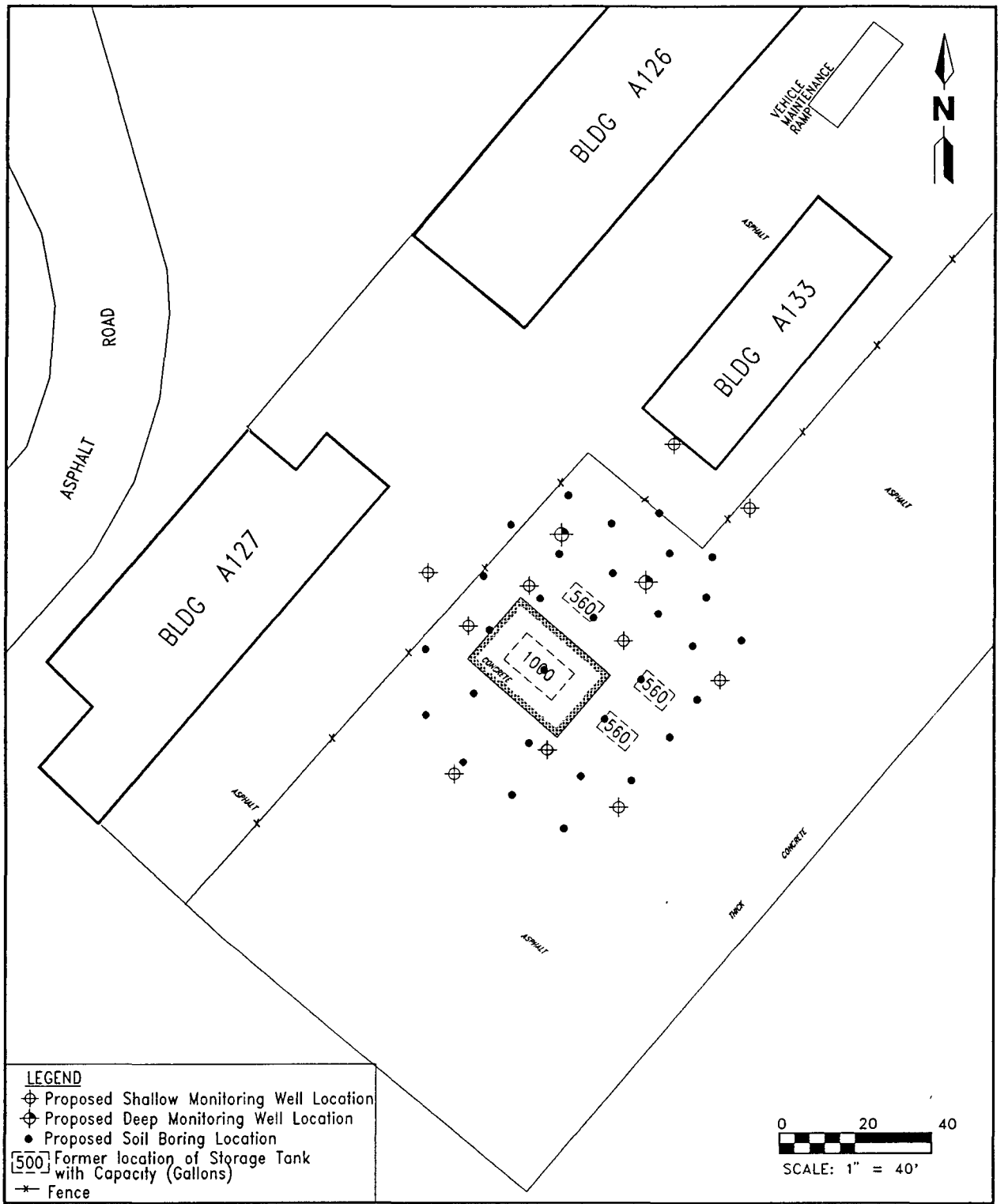


FIGURE 4-1
PROPOSED SOIL BORING AND MONITORING WELL LOCATIONS

CONTAMINATION ASSESSMENT PLAN
FLYING CLUB
BOCA CHICA FIELD
NAS KEY WEST
KEY WEST, FLORIDA

FLYCLUB/KGP/07/21/93

sand filter pack to at least 2 feet above the top of the screen. A 2-foot fine-grained sand (30/65 grade) seal will be placed immediately above the filter pack. The remaining annulus will be grouted to land surface with neat cement. The annular space surrounding the surface casing will also be grouted to land surface with neat cement.

A locking, watertight cap will be installed on each well. The monitoring wells will be finished below grade in a subsurface traffic-bearing vault and protected with a metal manhole assembly. Upon completion, all newly installed monitoring wells will be developed by pumping until the purged water is clear and relatively free of sediment to provide a good hydraulic connection with the surrounding aquifer.

Diagrams of typical shallow and deep monitoring wells, finished below grade, are illustrated in Figures 4-2 and 4-3, respectively. Detailed information of monitoring well construction, lithologic descriptions, split-spoon samples, and other pertinent data will be graphically displayed in boring logs in the Contamination Assessment Report (CAR). Soil will be classified in accordance with the Unified Soil Classification System.

Groundwater samples will be collected from all site monitoring wells that do not contain petroleum product and analyzed for total dissolved solids and the kerosene analytical group as described in FDEP Chapter 17-770, FAC. Appropriate quality assurance/quality control (QA/QC) samples will also be collected and analyzed. The following is a listing of the samples that will be collected during the site assessment:

- 12 monitoring well samples,
- two duplicate samples,
- one equipment blank (per day of sampling), and
- one trip blank.

Groundwater samples will be collected with Teflon™ bailers and shipped via overnight carrier to an FDEP- and U.S. Environmental Protection Agency (USEPA)-approved analytical laboratory. The analytical sampling program will comply with the ABB-ES FDER-approved Comprehensive Quality Assurance Plan (CompQAP).

Aquifer tests will be conducted to estimate the hydraulic properties of the water-table aquifer. Rising-head slug tests will be performed on a minimum of three monitoring wells to collect data for calculating hydraulic conductivity. Hydraulic conductivity will be calculated using the computer program AQTESOLV™ (Geraghty & Miller, Inc. 1989). The AQTESOLV™ program calculates hydraulic conductivity from slug test data following the methods of Bouwer and Rice (1976) for partially penetrating wells screened in unconfined aquifers.

A Florida-licensed professional surveyor will survey the horizontal and vertical coordinates for each of the monitoring wells for incorporation into either the U.S. Geological Survey (USGS) North American Datum of 1927 or base coordinate grid system.

During the field investigation, ABB-ES personnel and their subcontractors will coordinate efforts with the NAS Key West Environmental Coordinator to dispose of contaminated fluids and soil onsite. It will be the Navy's responsibility to dispose of any hazardous waste.

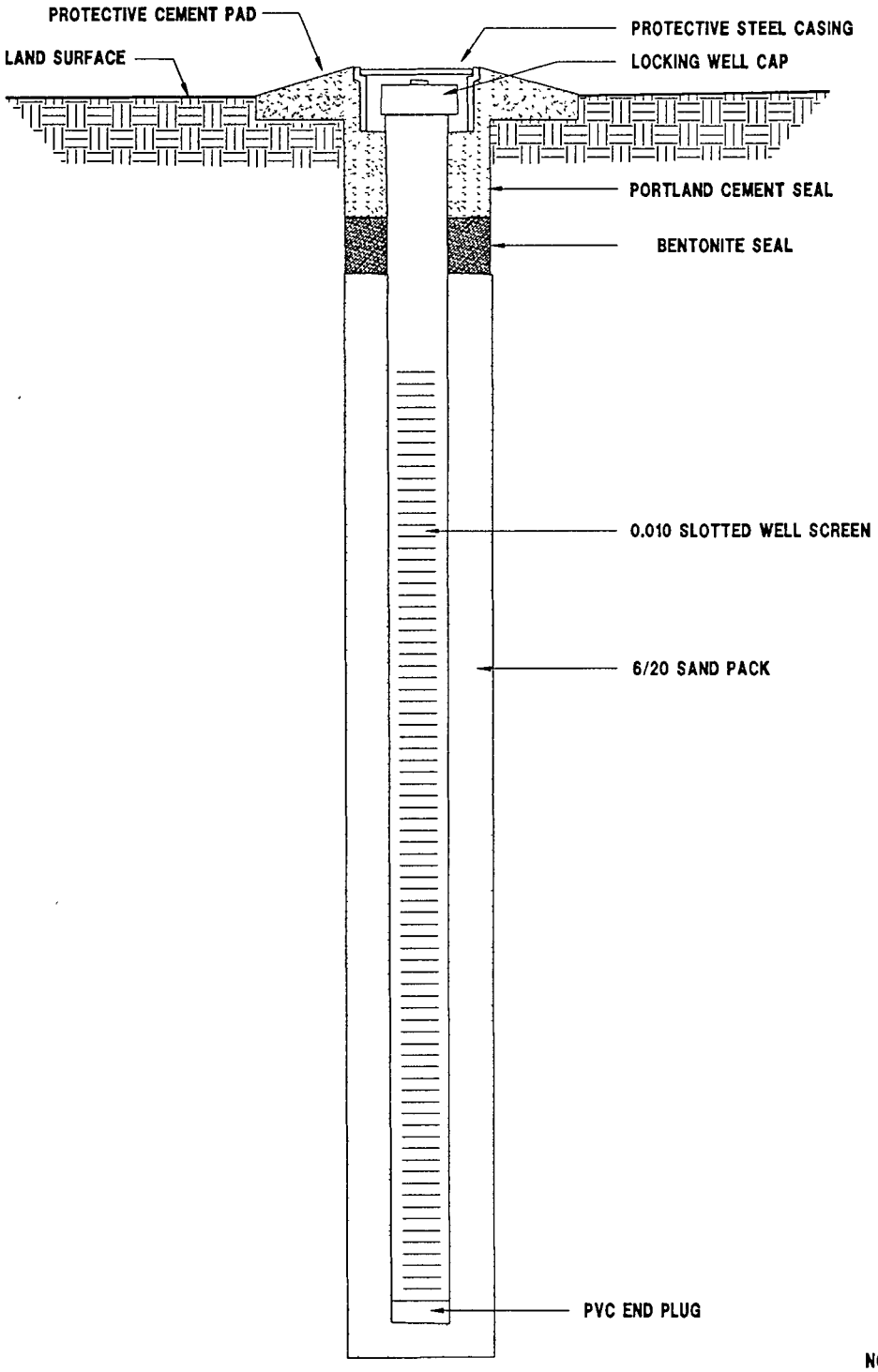
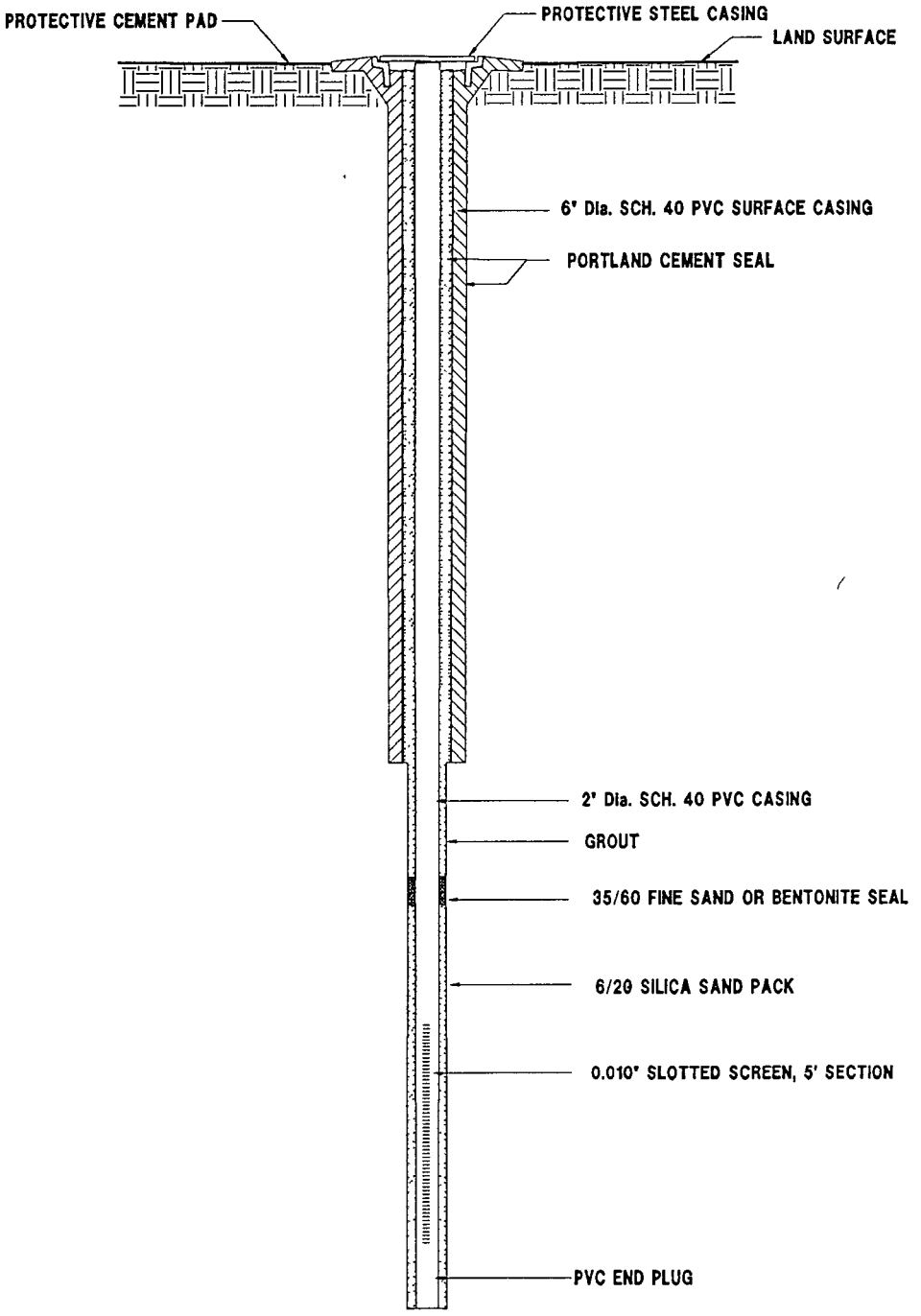


FIGURE 4-2
TYPICAL SHALLOW MONITORING WELL
INSTALLATION DETAIL

CONTAMINATION ASSESSMENT
PLAN
FLYING CLUB
BOCA CHICA FIELD
NAVAL AIR STATION KEY WEST
KEY WEST, FLORIDA

KEYWELL/KGP/06/28/93



NOT TO SCALE

FIGURE 4-3
TYPICAL DEEP MONITORING WELL INSTALLATION DETAIL

CONTAMINATION ASSESSMENT PLAN
FLYING CLUB
BOCA CHICA FIELD
NAVAL AIR STATION KEY WEST
KEY WEST, FLORIDA

KEYWELL/KGP/06/28/93

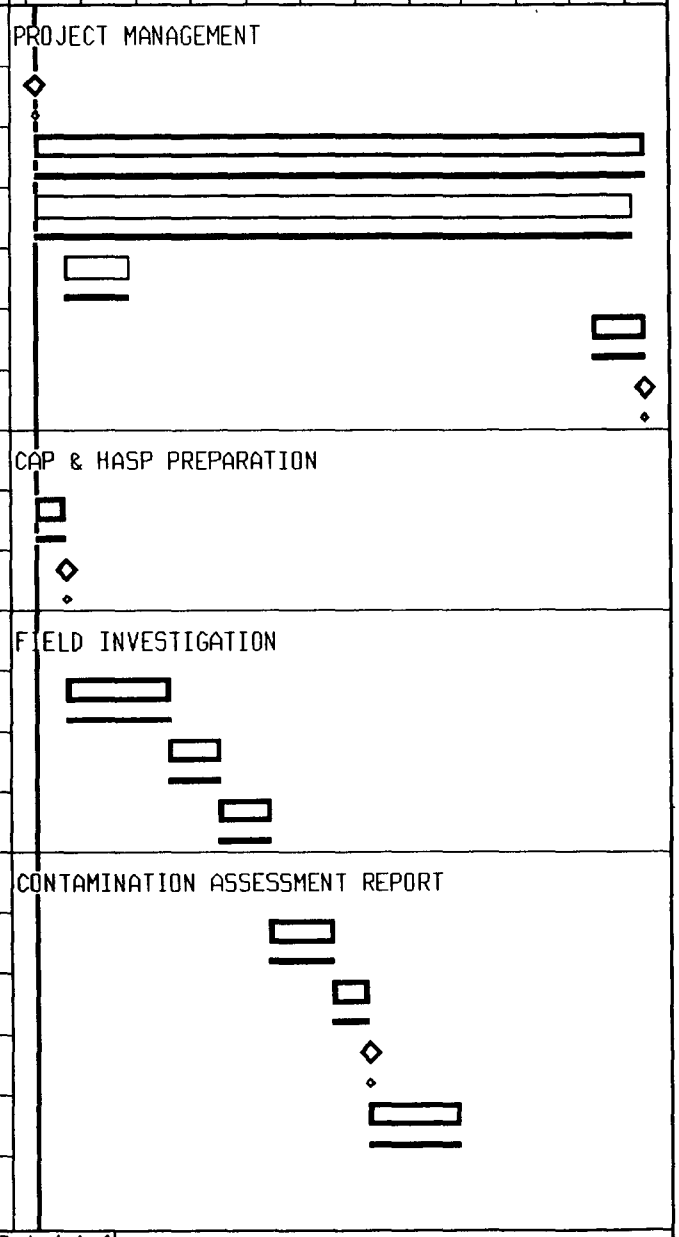
4.2 **PREPARATION OF REPORTS**. Subsequent to completion of the field investigations and receipt of the laboratory analytical results of the groundwater samples, a CAR will be prepared and submitted to SOUTHNAVFACENGCOM and the naval activity for review and approval. The report will discuss site background information, site conditions, findings, and recommendations for the Flying Club site, Building A127, Boca Chica Field at NAS Key West. Recommendations will also be made as to the need for any follow-up reports. Site location maps, locations of monitoring wells, groundwater elevation contour maps, and contaminant concentration contour maps will be included with the report.

Based on the findings and conclusions of the CAR, a No Further Action Proposal (NFAP), Monitoring Only Proposal (MOP), or Remedial Action Plan (RAP) will be recommended for the site. If a MOP is recommended in the CAR, a MOP will be prepared for the site. If remedial action is recommended in the CAR, a RAP will be prepared for the site.

5.0 SCHEDULE

A projected schedule to complete the CA field investigation program at the Flying Club is approximately 4 weeks (see Figure 5-1). This includes mobilization, drilling, sampling, surveying, aquifer testing, and demobilization. The field investigation work is scheduled to begin September 17, 1993. Upon completion of the field investigation, a 3-week turnaround time is anticipated before receipt of the laboratory analyses of the groundwater samples collected during the investigation. A CAR for the site is scheduled for submittal to SOUTHNAVFAC-ENGCOM by December 17, 1993. If time schedules for report review are followed, follow-up reports have been scheduled to be delivered to SOUTHNAVFACENGCOM by April 1, 1994.

ACTIVITY DESCRIPTION	EARLY START	EARLY FINISH	ORIG DUR
NOTICE TO PROCEED CTO NO 098	6JUL93		0
DAY-TO-DAY MANAGEMENT	6JUL93	10JUN94	238
TFMR REVIEW & PREPARATION	6JUL93	3JUN94	233
SUBCONTRACTOR PROCUREMENT PROCESS	23JUL93	26AUG93	25
CTO CLOSEOUT	13MAY94	10JUN94	20
CTO NO 098 COMPLETE		10JUN94	0
CAP/HASP PREPARATION	6JUL93	21JUL93	12
SUBMIT CAP/HASP TO NAVY		22JUL93	0
FIELD SCHEDULING DELAY	23JUL93	17SEP93	40
FIELD INVESTIGATION	17SEP93	15OCT93	21
LAB ANALYSIS/SURVEY	15OCT93	12NOV93	21
CAR PREPARATION	12NOV93	17DEC93	24
CAR REVIEW PROCESS	17DEC93	5JAN94	12
SUBMIT CAR TO FDER		6JAN94	0
FDER REVIEW OF CAR	6JAN94	25FEB94	37



Target Date 6SEP90
Plot Date 8JUL93
Data Date 6JUL93
Project Start 6JUL93
Project Finish 10JUN94

Activity Bar/Early Dates
Critical Activity
Progress Bar
Target Dates
◇/# Milestone/Flag Activity

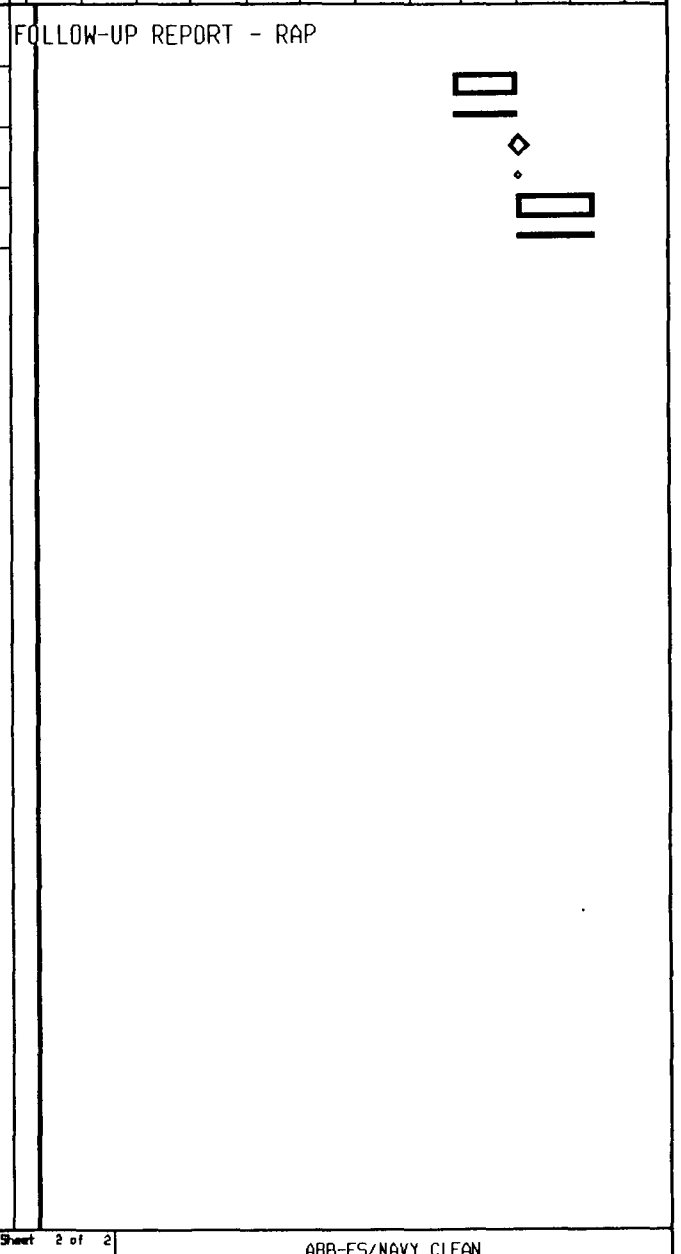
R007 A098 Sheet 1 of 2

CTO 098 - NAS KEY WEST FLYING CLUB
TOM - JACK PITTMAN
PROJECT SCHEDULE AS OF 18 JUNE 1993

ABB-ES/NAVY CLEAN

Date	Revision	Checked	Approved

ACTIVITY DESCRIPTION	EARLY START	EARLY FINISH	ORIG DUR
RAP PREPARATION	25FEB94	31MAR94	25
SUBMIT RAP TO FDER		1APR94	0
FDER REVIEW OF RAP	1APR94	13MAY94	31



Target Date 6SEP90
Plot Date 8JUL93
Data Date 6JUL93
Project Start 6JUL93
Project Finish 10JUN94

Activity Bar/Early Dates
Critical Activity
Progress Bar
Target Dates
◇/P Milestone/Flag Activity

R007 A098 Sheet 2 of 2

CTO 098 - NAS KEY WEST FLYING CLUB
TOM - JACK PITTMAN
PROJECT SCHEDULE AS OF 18 JUNE 1993

ABB-ES/NAVY CLEAN

Date	Revision	Checked	Approved

REFERENCES

ABB Environmental Services, Inc., 1991a, Contamination Assessment Report, Building A-322, Base Exchange Service Station, Boca Chica Field, NAS Key West: Tallahassee, Florida.

ABB Environmental Services, Inc., 1991b, Contamination Assessment Plan, Two Sites at Boca Chica Field (Facilities A-322 and A-317), and Three Sites at Truman Annex (PHMRON Wharf, PHMRON Ramp, and Building 103), NAS Key West: Tallahassee, Florida.

Black, Crow, and Eidness, 1977, Monroe County 201 Wastewater Facility Plan: Draft Copy No. 11.

Bouwer, H., and Rice, R.C., 1976, A slug test for determining hydraulic conductivity of unconfined aquifers with completely or partially penetrating wells: Water Resources Research, vol. 12, p. 423-428.

Florida Department of Environmental Regulation, February 1991, Guidelines for assessment and remediation of petroleum contaminated soil: Division of Waste Management, 33 p.

Geraghty & Miller, Inc., 1989, AQTESOLV™, aquifer test design and analysis: computer version 1.0.

Hoffmeister, J.E., 1974, Land from the sea, the geologic story of south Florida: Coral Gables, University of Miami Press, 143 p.

McKenzie, D.J., 1990, Water resources potential of the freshwater lens at Key West, Florida: U.S. Geological Survey Water-Resources Investigations Report 90-4115, 24 p.